

REMARKS

In the Office Action, the Examiner noted that claims 1-107 are pending in the application, and that claims 1-3, 6-9, 11, 12, 14-20, 23-27, 29, 38-41, 43, 44, 46-49, 51, 52, 54-58, 60, 61, 63-75 and 84-107 stand rejected. Claims 1, 2, 5, 9, 11, 13, 16, 19, 22, 24, 30, 38, 41, 42, 48, 50, 56, 59, 65, 84, 102, 103, 104, 105, 106, and 107 are amended herein. New claims 108-112 are added. Claims 4, 10, 21, 28, 31-37, 45, 53, 62, 76-83 and 92-101 are canceled without prejudice. In view of the above amendments and the following discussion, the Applicants submit that all of these claims are now in condition for allowance.

I. REJECTION OF CLAIMS UNDER 35 U.S.C. § 112

Claim 107 stands rejected under 35 U.S.C. § 112, first paragraph. The rejection is now moot since the language has been removed from this claim.

Claims 41 and 93 stand rejected under 35 U.S.C. § 112, second paragraph. The Examiner stated with respect to claim 41 that "the phrase 'the inlet stages' is vague and indefinite because it lacks proper antecedent basis." The Examiner stated with respect to claim 93 that "the phrase 'comprises a length of less than 2 m' is unclear because claim 93 depends from claim 92, which requires a foreline length of at least 3 meters, and also the 'comprising' language does not appear to limit the length of the foreline to less than 2 meters."

Claim 41 has been amended to depend from claim 40 to provide proper antecedent basis for the term "inlet stages", thus obviating the rejection under 35 U.S.C. § 112, second paragraph.

Claim 93 has been canceled, thus obviating the rejection.

The typographical errors pointed out by the Examiner in claims 103 and 106 have been corrected.

Thus, Applicants submit that claims 41, 103, 106 and 107, as they now stand, fully satisfy the requirements of 35 U.S.C. § 112. Accordingly, the Applicants respectfully request the rejection to these claims be withdrawn.

II. REJECTION OF CLAIMS UNDER 35 U.S.C. §102 and 35 U.S.C. §103

Claims 4, 5, 10, 13, 21, 22, 28, 30, 42, 45, 50, 53, 59, and 62 stand objected to as being dependent upon a rejected base claim, but were determined by the Examiner to be allowable if rewritten in independent form. Base claims 1, 9, and 16, have been amended to substantially incorporate the limitations of claims 4, 10, and 21, respectively, and all intervening claims. Base claims 24, 38, 48, and 56, have been amended to incorporate the limitations of claims 28, 45, 53, and 62, respectively, and all intervening claims. Claims 5, 13, and 22, have been substantially rewritten in independent form. Claims 30, 42, 50, and 59, have been rewritten in independent form. Therefore, independent claims 1, 5, 9, 13, 16, 22, 24, 30, 38, 42, 48, 50, 56, and 59 are patentable over the prior art of record. Claims 2, 3, 6-8, 11, 12, 14, 15, 17-20, 23, 25-27, 29, 39-41, 43, 44, 46, 47, 49, 51, 52, 54, 55, 57, 58, 60, 61, 63, and 64 are patentable at least by virtue of depending from their respective base claims.

Olson (U.S. Patent No. 5,709,753)

Claims 1, 6, 8, and 16 were rejected under 35 U.S.C. § 102(a) as being anticipated by *Olson*. Claims 2, 3, 19, 20, 92-95, and 97-100 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of *Olson*.

Claim 1 has been amended to substantially include the limitations of claim 4. Claim 1 was amended to include a “pump being substantially absent a foreline between the inlet of the pump and the chamber”, which is not taught or suggested in *Olson*. Thus, claim 1 is patentable over *Olson*. Claims 2, 3, and 6-8 are patentable at least by virtue of their dependence from claim 1.

Claim 16 has been amended to substantially include the limitations of claim 21. Claim 16 was amended to include a “pump being substantially absent a foreline between the inlet of the pump and the chamber”, which is not taught or suggested in *Olson*. Thus, claim 16 is patentable over *Olson*. Claims 17-20 and 23 are patentable at least by virtue of their dependence from claim 16.

Claims 92-95 and 97-100 have been canceled rendering their rejection moot.

Ackley (U.S. Patent No. 4,534,314)

Claims 1, 6, 8, 9, 14 and 16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Ackley*. Claims 2, 3, 11, 12, 19, 20, 92-95, and 97-100 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of *Ackley*.

Claim 1 has been amended to substantially include the limitations of claim 4. Claim 1 was amended to include a “pump being substantially absent a foreline between the inlet of the pump and the chamber”, which is not taught or suggested in *Ackley*. Thus, claim 1 is patentable over *Ackley*. Claims 2, 3, and 6-8 are patentable at least by virtue of their dependence from claim 1.

Claim 9 has been amended to substantially include the limitations of claim 10. Claim 1 was amended to include an “inlet being connected to the load-lock chamber and substantially absent a foreline”, which is not taught or suggested in *Ackley*. Thus, claim 9 is patentable over *Ackley*. Claims 11, 12, 14 and 15 are patentable at least by virtue of their dependence from claim 9.

Claim 16 has been amended to substantially include the limitations of claim 21. Claim 16 was amended to include a “pump being substantially absent a foreline between the inlet of the pump and the chamber”, which is not taught or suggested in *Ackley*. Thus, claim 16 is patentable over *Ackley*. Claims 17-20 and 23 are patentable at least by virtue of their dependence from claim 16.

Claims 92-95 and 97-100 have been cancelled rendering the rejection moot.

Kagaso (JP 04-358531)

Claims 1-3, 6-9, 11, 12, 14-16, 19, 20, 23, 24-27, 29, 65-71, 73, 75, 84-90, and 92-107 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over *Kagaso*.

Claim 1 has been amended to substantially include the limitations of claim 4. Claim 1 was amended to include a “pump being substantially absent a foreline between the inlet of the pump and the chamber”, which is not taught or suggested in *Kagaso*.

Thus, claim 1 is patentable over *Kagaso*. Claims 2, 3, and 6-8 are patentable at least by virtue of their dependence from claim 1.

Claim 9 has been amended to substantially include the limitations of claim 10. Claim 9 was amended to include an “inlet being connected to the load-lock chamber and substantially absent a foreline”, which is not taught or suggested in *Kagaso*. Thus, claim 9 is patentable over *Kagaso*. Claims 11, 12, 14 and 15 are patentable at least by virtue of their dependence from claim 9.

Claim 16 has been amended to substantially include the limitations of claim 21. Claim 16 was amended to include a “pump being substantially absent a foreline between the inlet of the pump and the chamber”, which is not taught or suggested in *Kagaso*. Thus, claim 16 is patentable over *Kagaso*. Claims 17-20 and 23 are patentable at least by virtue of their dependence from claim 16.

Claim 24 has been amended to include the limitations of claim 28, which was deemed patentable by the Examiner. Claims 25-27 and 29 are patentable at least by virtue of their dependence from claim 24.

Claims 65, 84, 102, and 107 stand rejected under §102(b) and §103(a) in view of *Kagaso*. *Kagaso* discloses that “the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m.” (*Kagaso*, translation, pg. 10, lines 21-23) *Kagaso* fails to disclose or render obvious a “pump being substantially absent a foreline between the inlet of the pump and the chamber” as claimed in claims 65, 84, 102, and 107. Therefore, claims 65, 84, 102, and 107 are patentable over *Kagaso*. Claims 66, 67, and 69-75, are patentable at least by virtue of their dependence from claim 65, and claims 85-91 are patentable at least by virtue of their dependence from claim 84.

Claims 92-96 and 97-100 have been canceled rendering the rejection moot.

Claim 103 was rejected under §102(b) and §103(a) in view of *Kagaso*. *Kagaso* discloses that “the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m.” (*Kagaso*, translation, pg. 10, lines 21-23) *Kagaso* fails to disclose or render obvious “the inlet being connected

directly to the load-lock chamber and substantially absent a foreline" as claimed. Therefore, claim 103 is patentable over *Kagaso*.

Claim 104 stands rejected under §102(b) and §103(a) in view of *Kagaso*. *Kagaso* discloses that "the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m." (*Kagaso*, translation, pg. 10, lines 21-23) *Kagaso* fails to disclose or render obvious "the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber" as claimed. Therefore, claim 104 is patentable over *Kagaso*.

Claim 105 stands rejected under §102(b) and §103(a) in view of *Kagaso*. *Kagaso* discloses that "the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m." (*Kagaso*, translation, pg. 10, lines 21-23) *Kagaso* fails to disclose or render obvious "a length of less than about 2 meters" as claimed. Therefore, claim 105 is patentable over *Kagaso*.

Claim 106 stands rejected under §102(b) and §103(a) in view of *Kagaso*. *Kagaso* discloses that "the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m." (*Kagaso*, translation, pg 10, ln 21-23) *Kagaso* fails to disclose or render obvious "a length of less than about 2 meters" as claimed. Therefore, claim 106 is patentable over *Kagaso*.

Kagaso in view of Hanakada (JP 02-184333)

Claims 16, 19, 20, 23, and 104 stand rejected under 35 U.S.C. § 103(a) as being obvious over *Kagaso* in view of *Hanakada*.

Patentability of claims 16-20 and 23 has been addressed in the previous section titled "*Kagaso*".

Claim 104 stands rejected under §103(a) as being obvious over *Kagaso* and *Hanakada*. *Kagaso* discloses that "the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m." (*Kagaso*, translation, pg. 10, lines 21-23) *Kagaso* fails to disclose or render obvious "the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber" as claimed. *Hanakada* does not cure this deficiency. The Office

Action states that *Hanakada* teaches the desirability of providing “a gas distributor in a loadlock chamber for providing inert gas to raise the pressure of the chamber to atmospheric pressure.” Neither of the cited references disclose nor render obvious “the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber” as claimed. Therefore, claim 104 is patentable over *Kagaso* in view of *Hanakada*.

Kagaso in view of Hanakada, Suzuki (U.S. Patent No. 6,080,679), and Sato (JP 07-167053)

Claims 17, 18, and 104 stand rejected under 35 U.S.C. § 103(a) as being obvious over *Kagaso* in view of *Hanakada*, *Suzuki*, and *Sato*.

Patentability of claims 17 and 18 has been addressed in the previous section titled “*Kagaso*”.

Claim 104 stands rejected under §103(a) as being obvious over *Kagaso*, *Hanakada*, *Suzuki*, and *Sato*. *Kagaso* discloses that “the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m.” (*Kagaso*, translation, pg. 10, lines 21-23) *Kagaso* fails to disclose or render obvious “the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber” as claimed. *Hanakada*, *Suzuki*, and *Sato* do not cure this deficiency. The Office Action states that *Hanakada* teaches the desirability of providing “a gas distributor in a loadlock chamber for providing inert gas to raise the pressure of the chamber to atmospheric pressure.” The Office Action also states that “*Suzuki...and Sato...teach[es] the use of a low vacuum skimming pump (roughing pump) connected to a loadlock chamber with a high vacuum pump interposed between the loadlock and low vacuum pump.*” Neither of the cited references disclose nor render obvious “the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber” as claimed. Therefore, claim 104 is patentable over *Kagaso* in view of *Hanakada*, *Suzuki*, and *Sato*.

Kagaso in view of Suzuki or Sato

Patentability of claims 16-20 and 23 has been addressed in the previous section titled "*Kagaso*".

Claim 104 stands rejected under §103(a) as being obvious over *Kagaso*, *Hanakada*, *Suzuki*, and *Sato*. *Kagaso* discloses that "the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m." (*Kagaso*, translation, pg. 10, lines 21-23) *Kagaso* fails to disclose or render obvious "the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber" as claimed. *Suzuki* and *Sato* do not cure this deficiency. The Office Action states that "Suzuki...and Sato...teach the use of a roughing pump connected to a process chamber." Neither of the cited references disclose nor render obvious "the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber" as claimed. Therefore, claim 104 is patentable over *Kagaso* in view of *Suzuki* or *Sato*.

Kagaso in view of Beyer (U.S. Patent No. 5,944,049)

Patentability of claims 72, 74 and 91 has been addressed in the previous section titled "*Kagaso*".

Claim 107 stands rejected over *Kagaso* in view of *Beyer*. *Kagaso* discloses that "the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m." (*Kagaso*, translation, pg. 10, lines 21-23) *Kagaso* fails to disclose or render obvious a "pump being substantially absent a foreline between the inlet of the pump and the chamber" as recited in claim 107. The combination of *Kagaso* and *Beyer* fails to cure this deficiency. The Office Action states that "Beyer...teaches that the vacuum pressure in a chamber can be accurately controlled by connecting the controller to a chamber pressure gauge to provide feedback control of the pump speed. Neither of the cited references disclose nor render obvious a "pump being substantially absent a foreline between the inlet of the pump and the chamber" as claimed. Therefore, claim 107 is patentable over *Kagaso* in view of *Beyer*.

Arami (U.S. Patent No. 5,575,853)

Claims 92-96 have been cancelled without prejudice rendering the rejection moot.

Arami in view of Beyer and Kagaso

Claim 96 has been cancelled without prejudice rendering the rejection moot.

Claim 105 was rejected over *Arami* in view of *Beyer* and *Kagaso*. *Arami* discloses that “dry pump 27 is located in a utility box that is some distance from the processing chamber 2 within the clean room, a long auxiliary pipeline 26 of approximately 10 to 12 m is used.” (col. 5, lines 13-16) *Kagaso* discloses that “the inner diameter of the exhaust pipe 26 is 50 mm, and the distance between the vessel 16 and the vacuum pump 30 is 2 m.” (*Kagaso*, translation, pg. 10, lines 21-23) *Arami* and *Kagaso* fail to disclose or render obvious “a length of less than about 2 meters” as claimed. Additionally, there would have been no motivation to combine *Arami* with *Kagaso* and *Beyer* since *Arami* teaches the use of longer pipes. Therefore, claim 105 is patentable over *Arami* in view of *Beyer* and *Kagaso*.

Beyer

Claims 1, 6-8, 16-18, 23-27, 38, 40, 43, 46-48, 51, 54, 55, 102 and 104 stand rejected under 35 U.S.C. § 102(e) as anticipated by or, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over *Beyer*.

Claim 1 has been amended to substantially include the limitations of claim 4. Claim 1 was amended to include a “pump being substantially absent a foreline between the inlet of the pump and the chamber”, which is a limitation not found in *Beyer*. Claims 2, 3, and 6-8 are patentable at least by virtue of their dependence from claim 1.

Claim 16 has been amended to substantially include the limitations of claim 21. Claim 16 was amended to include a “pump being substantially absent a foreline between the inlet of the pump and the chamber”, which is a limitation not found in

Beyer. Claims 17-20 and 23 are patentable at least by virtue of their dependence from claim 16.

Claim 24 has been amended to include the limitations of claim 28, which was deemed patentable by the Examiner. Claims 25-27 and 29 are patentable at least by virtue of their dependence from claim 24.

Claim 38 has been amended to include the limitations of claim 45, which was deemed patentable by the Examiner. Claims 39, 40, 41, 43, 44, 46 and 47 are patentable at least by virtue of their dependence from claim 38.

Claim 48 has been amended to include the limitations of claim 53, which was deemed patentable by the Examiner. Claims 49, 51, 52, 54, and 55 are patentable at least by virtue of their dependence from claim 48.

The Examiner did not address claims 102 and 104 in the rejection. However, these claims have been amended to include the limitations "the pump being substantially absent a foreline between the inlet of the pump and the chamber" and "the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber", respectively. These limitations are not taught by *Beyer*. Therefore, claims 102 and 104 are patentable over *Beyer*.

Conrad (U.S. Patent No. 5,733,104)

Claims 38-41, 43, 46, 48, 49, 54, 56, 58, 63, and 64 stand rejected under 35 U.S.C. § 102(a) as anticipated by or, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over *Conrad*.

Claim 38 has been amended to include the limitations of claim 45, which was deemed patentable by the Examiner. Claims 39, 40, 41, 43, 44, 46 and 47 are patentable at least by virtue of their dependence from claim 38.

Claim 48 has been amended to include the limitations of claim 53, which was deemed patentable by the Examiner. Claims 49, 51, 52, 54, and 55 are patentable at least by virtue of their dependence from claim 48.

Claim 56 has been amended to include the limitations of claim 62, which was deemed patentable by the Examiner. Claims 57, 58, 60, 61, 63, and 64 are patentable at least by virtue of their dependence from claim 56.

Conrad in view of Kagaso and Arami

Claims 44, 52, 57, and 61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Conrad* in view of *Kagaso* and *Arami*.

Patentability of claims 44, 52, 57, and 61 has been addressed in the previous section titled "*Conrad*".

Conrad in view of Beyer

Claims 44, 52, 57, and 61 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Conrad* in view of *Beyer*.

Patentability of claims 43, 51, and 60 has been addressed in the previous section titled "*Conrad*".


CONCLUSION

Thus, Applicants submit that none of the claims presently in the application are indefinite under the provisions of 35 U.S.C. § 112, anticipated under the provisions of 35 U.S.C. § 102, or obvious under the provisions of 35 U.S.C. § 103. Consequently, Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. B. Todd Patterson at (713) 623-4844 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,


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